



SIERRA LEONE

REPORT
OF THE
WEST AFRICAN RICE RESEARCH STATION
ROKUPR
1953

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1955

West African Rice Research Station, Rokupr Report—1953

INTRODUCTION

While the year saw great improvement, both in the staff position and in construction work, the station was still only in the process of transformation to an inter-territorial research station, and much of the energies of all the staff were engaged in administration and the inevitable organisation of equipment and stores arriving from the United Kingdom. Little new research was initiated therefore and concentration was on the continuance of work already in hand and certain preliminary work for the future programme.

STAFF

2.

P. Adames—*Principal Agricultural Officer, Colonial Agricultural Service.*

H. D. Jordan—*Agricultural Officer, Colonial Agricultural Service*

W. Jackson—*Plant Breeder, Colonial Research Service.*

One vacancy.

T. E. Tomlinson—*Soil Chemist, Colonial Research Service*

One vacancy.

Neither the Plant Breeder nor the Chemist was at Rokupr throughout the year.

3. Mr. Jackson visited Nigeria from 28th June to 19th September attending a course in Agricultural Statistics and visiting rice schemes at Bida, and Dr. Tomlinson was seconded to Rothampstead Experimental Station for the first part of the year and only arrived at Rokupr on 14th April. Much of the work therefore devolved upon the senior officers who also had their Agricultural extension work to supervise.

4. The junior staff position is summarised in the following table:—

						<i>Projected</i>	<i>Appointed</i>
Clerks	..	..	..	..	..	4	2
Storekeeper		..	..	..	..	1	1
Librarian	..	..	..	..	..	1	0
Agricultural Instructors		..	..	..	..	7	1
Laboratory Assistants		..	..	..	..	2	0
Laboratory Attendants		..	..	..	..	4	2
Artisans, etc.	..	..	..	..	..	25	7

In addition junior Agricultural departmental staff assisted from time to time.

CONSTRUCTION

5. At the beginning of the year construction of the main laboratory and office building was started by the Public Works Department. This building was completed by the end of the year, but owing to delay in receipt of fittings it was not fitted internally. It is an L-shaped building, one wing being for administration and the other for research. Accommodation consists of offices for the Principal Agricultural Officer, the Agricultural Officer and clerks, and of a Library in the one wing, and Botanists' and Chemists' offices and laboratories, dark room, stores and a room for the gas plant in the other wing. Most of the fittings, furniture and equipment arrived at the end of the year—part from laboratory suppliers in the United Kingdom and part made in the Public Works Department's workshops—and it was hoped that the fitting would be completed early in 1954.

6. A power station was built and two generating sets installed, overhead transmission lines were erected and wiring of completed buildings carried out. A 24-hour supply of electricity was available from 1st June. Provision exists for two further generating sets to be installed in the power station in conjunction with the wiring of Rokupr town and these will be paid for from local funds.

7. A temporary water supply was available from June. Connections were made to service tanks at all buildings but, owing to delay in arrival of the main overhead storage tank, pumping was confined to a few hours each day. The water supply serves Rokupr town.

8. Two new Senior Service quarters were completed before the beginning of the year and alterations to one old one were carried out. During the year the third and last of the new quarters was finished and alterations were made to a further two old houses. One house remained for attention but owing to its present condition, it was not yet certain whether it should be altered or replaced. One of the two new rest-houses was fitted out with a complete set of equipment to provide accommodation for visitors from other territories. Two new Junior Service quarters were built, making the total six so far.

9. A field laboratory building for the Botanist, consisting of laboratory, office and store, was completed, and a plant cage was built nearby. Two drying floors for experimental material had been completed previously. A small fuel store was also built for the high octane aviation petrol required for the gas plant.

10. *Library*.—A nucleus of books was formed and a number of journals began to be regularly received. A punched card abstracting system was started for pamphlets and papers of interest in the journals.

11. *Transport*.—The only road transport vehicle available during the year was a Commer 30-cwt. van. This underwent a thorough overhaul. A 3-ton Bedford lorry was ordered but this had not arrived by the end of the year. The 38-foot diesel driven departmental launch was available throughout the year, and a T. 20 runabout launch was purchased for quick trips on the river.

12. *Station layout*.—Apart from the area of upland used for the buildings the station still consists of some twenty-seven acres of tidal swamp land between the upland and the river. This land is divided into fifty-six blocks of approximately half an-acre each, though owing to the necessity of delineating the blocks according to the slight difference in levels over the area, the sizes are somewhat variable. All of this land is now subject to flooding by fresh water from the river under tidal influence. In addition thirteen acres of swamp land immediately opposite the station are under lease and in 1953 were used for seed multiplication. For several years previously they had been sublet.

13. Marginal land between the upland and the swamp was used for the nurseries.

14. A large part of the farm is not yet needed for experimental work and was as hitherto, planted for multiplication purposes with pure seed rice of the seven major varieties under distribution. These varieties and the seed produced are shown below. The figures are shown in the commercial units of Sierra Leone bushels which are weights of 60 lbs. paddy. (A bushel of clean rice is a weight of 84 lbs.)

Bolo 108	..	..	..	50	bushels
D. 99	..	..	..	31	"
India pa lil 46	..	..	..	47	"
Indo China 70	..	..	..	3	"
Kav. 12	..	..	..	29	"
Ngasein 57	..	..	..	86	"
Toma 112	..	..	..	200	"

15. All seed was maintained at a high level of purity.

16. *Weather*.—Full meteorological records are given in Appendix A.

17. The season's rainfall was slightly below average but the distribution conformed very much to the usual pattern with the exception that the intense rainfall usually experienced in August occurred a week or two earlier in July, and August and September had rainfall well below average. One foot and four feet earth thermometers were installed at the end of the year.

18. *Miscellaneous work other than with rice.*—No other annual crops are now grown on the Station. Perennial crops are confined to fruit trees, oil-palms and pineapples. A vegetable garden and nursery continued to be maintained.

19. The small herd of Ndama cattle remained on the station and continued to thrive.

20. *Contacts with other countries.*—Correspondence was maintained with other countries on a number of subjects connected with rice. Rice varieties were sent in many cases and a list of these is given in Appendix B.

OVERSEAS VISITORS TO ROKUPR

A Caseley-Hayford	..	..	..	Minister of Agriculture, Gold Coast
P. H. Nye	..	..	..	Achimota College, Gold Coast
A. Morris	..	..	..	Colonial Office
R. W. Piper	..	..	..	Colonial Office
D. Rhind	..	..	..	W.A.I.T.S., Accra, Gold Coast
Sir H. Sanderson	..	..	..	Great Britain.

AGRONOMY SECTION

21. Following the results of earlier experiments, cultivation of the farm was carried out in February and March. Owing to a delay in receiving spare parts from Britain the use of the M.G. 5 tractor and plough on the drier parts of the farm as in the preceding year was impossible. Hand hoeing was therefore practised throughout.

22. Other cultural practices were standardised on the results of previous experiments. A nursery seed rate of 750 lb. per acre was adopted on new nurseries that were laid out, although on older nurseries which had not yet been altered the seed rate was in the order of 1,000 lb. per acre. Although past experiments did not show any detrimental effect from this higher seed rate it tended to produce a weaker seedling and the lower seed rate was thought preferable. The time of nursing is about six weeks.

23. Transplanting was carried out in the traditional native manner with the aid of a forked planting tool, but whereas the native farmer prefers widespacing and many seedlings to the stand, it was proved at Rokupr that better results could be obtained from a spacing of six to nine inches and two to three seedlings to the stand.

24. Yields were unfortunately poor in general throughout the farm this year. Details are given in Appendix C. These poor yields are attributable to two factors, weak seedlings and attack by crabs.

25. Despite fertiliser application the nurseries proved rather infertile this season and, as a result of this and of a dry sunny spell at the critical stage of growth, *Piricularia oryzae* was widespread and a bad attack of "scorch" ensued. The seedlings were thus rather undersized at transplanting.

26. In the previous two years attack by crabs (*Sesarma africanum*) on the newly transplanted seedlings had become a problem. For many years before this crabs had not been numerous though in the early days of the station they caused some trouble. This year they were again plentiful and the damage caused was widespread. This was probably accentuated by the weakness of the seedlings. As a result considerable replanting had to be carried out and much of the farm had a patchy appearance.

27. This crab infestation has become a major problem on the farm and information has been sought how best to combat it. It was hoped to institute trials in control in 1954. Trapping proved ineffective despite the fact that some 32,000 crabs were caught and destroyed during the season.

28. Four years ago a radical change in policy was made with regard to the drier and less fertile parts of the farm. Prior to this, early maturing rices were grown on these areas. Observations had however indicated that growth and tillering tended to be slower and that abundant water was more necessary in the tillering stages than when the grain was setting. These areas, while being relatively dry and having a shorter period when there is free water on the land, remained moist enough for adequate swelling of the grain later in the season. Late maturing types were therefore substituted on the theory that the longer time available for growth and tillering would reflect in higher yields.

29. This year two of the blocks were under experiments and three others reverted to early maturing rices. The following table showing yields on these blocks in lbs. per acre over the last nine years, though not necessarily proving the theory, demonstrates that the expected results have been obtained.

1945	1946	1947	1948	1949	1950	1951	1952	1953
240	180	90	530	580	*1,370	*1,420	*1,630	189
960	790	480	930	720	*1,260	*1,320	*1,660	723
480	680	1,080	(1,860)	930	*1,640	*1,650	*1,840	—
900	1,040	1,220	(2,170)	810	*1,680	*2,480	*1,170	—
230	300	890	600	160	*930	*890	*600	*1,933
310	*1,920	1,360	(1,860)	960	*1,440	1,100	*1,150	*1,148
850	870	570	680	530	*1,260	660	1,010	864

* Long term rice grown. () fertiliser application.

30. Previous work at Rokupr has shown that early digging of the land leads to increased yields. It is noticeable in recent years however that native farmers are changing their digging habits. In the past where growth of the salt resistant grass *Paspalum vaginatum* has been heavy they have dug the land early in the year, thus drying out the roots of the grass and killing much of it. More recently however many farmers are leaving the digging until much later in the season, some in fact digging at planting time and planting the rice seedlings in the upturned sods. Observation plots were laid down in 1950 and 1951 on land where this grass forms a continuous cover in the dry season. This is found away from Rokupr towards the mouth of the Great Scarcies River. Results obtained were conflicting and it appeared that the actual date of the early digging might be significant. A statistical experiment was laid down this year with different dates of digging. Unfortunately no results were obtained owing to unauthorised harvesting of the crop.

31. No fertiliser experiments were carried out in 1953. On account of previous results with superphosphate a number of 1-acre demonstration plots were laid out by Agricultural staff on tidal rice land and all showed increased yields from superphosphate application.

BOTANY SECTION

32. A list of the number of new introductions of rice made is given in Appendix D. Only small amounts of seed were received and this seed was multiplied in the first instance for fuller observation to be made in 1954.

33. One hundred and ninety-two introduced rices remain in the collection and were grown in small plots. Many of these were still under observation while some were maintained for future work. Of the more recent introductions some rices from Ceylon, Malaya and the Philippines showed signs of promise and will be grown on a larger scale in 1954 for further observation and recording.

34. A statistical yield trial was carried out with a number of introduced early varieties. These were the best yielders from two trials laid down in 1952. Yields in lbs. per acre were as follows:—

<i>Variety</i>	<i>Origin</i>	<i>Yield</i>
D. 99	British Guiana	1,921
2/16	Tanganyika	1,915
2/8	do.	1,884
D. 52/37	British Guiana	1,864
D. 114	do.	1,820
Patnai	East Bengal	1,742
B.G. 79	British Guiana	1,695
Afaa Mwanza	Tanganyika	1,628
Lead	British Guiana	1,574

35. There was considerable variation between the plots and no statistical significance was shown. This lack of uniformity of the soil has meant for some years that statistical significance is only shown when there is a very great difference between the yields of treatments and varieties.

36. SELECTION.—D. 99 an early rice variety which was introduced from British Guiana in 1940 and which has been established and multiplied as one of the best early varieties to date, has become genetically impure. An area was therefore planted with single seedlings and at harvest selection on a single plant basis was carried out.

37. Selection was also made in the field of single panicles of the local deep water rice Mbagboli, widely grown in the Bum Kittam flooded grasslands in the south of the country.

38. Six remaining strains of G.E.B. 24, introduced from Madras in 1931 and selected in 1950, were planted as single plants for character recording and for flowering date records. Two of these were discarded as they showed signs of segregation. These six strains were also put into a statistical yield trial in comparison with unselected stock as a control. Yields in lbs. per acre were as follows:—

<i>Strain</i>	<i>Yield</i>
31	1,192
17	1,064
9	1,010
37	1,003
C	942
41	918
20	885

No statistical significance was shown.

39. Two other statistical yield trials were also laid down, with selections of the British Guiana rices Lead and B.G. 79 made in 1949. No statistical significance was shown in either case. Yields in lbs. per acre were as follows:—

	<i>Strain</i>	<i>Yield</i>
Lead	20	1,418
	42	1,411
	46	1,263
	43	1,202
	35	1,151
	25	1,148
	44	1,128
	34	1,101
	C	1,033
B.G. 79	16	1,881
	3	1,685
	2	1,671
	20	1,671
	22	1,611
	30	1,604
	1	1,540
	C	1,509

40. Eight strains of Sughandi and six of Kurulutuduwi b. 13 also made in 1948 were maintained. Single seedlings planted for character recording were destroyed by crabs. Sughandi was introduced under this name from Burma in 1936. It is the rice more correctly known as A 28-6. Kurulutuduwi came from Ceylon in 1942.

41. Remaining strains of older selections were maintained for future work. These are:—

- (i) Toma (14 strains). Toma is a popular local main crop rice. Early selections had good yields but weak straw. At present Toma 112 is under distribution as a very strong strawed rice, but its yield though good is not outstanding and it has a pale honey coloured pericarp.
- (ii) India pa lil (13 strains). A very popular late local rice. India pa lil 46 is at present under distribution.
- (iii) Kavunginpoothala (5 strains). A high yielding late rice from Madras. Suffers from *Piricularia oryzae* in the nursery. Strain 12 (Kav. 12) is being distributed.
- (iv) Ngasein (3 strains). A high yielding late maincrop rice from Burma (C 19-26). Ngasein 57 is being distributed.
- (v) Kalimodu (7 strains). A popular local maincrop rice.
- (vi) Pokkali (5 strains). From Ceylon in 1942. Said to be salt resistant.
- (vii) Indo China (4 strains). A floating rice. While strain 24 has given the best yields under ideal conditions, strain 53 is proving more resistant to wash and is therefore outyielding 24 in many cases in the field.

42. Except for the Pokkali selections which are being kept for laboratory tests on salt resistance, these selections are being maintained for milling tests. An experimental mill was obtained but has not proved satisfactory and it is proposed to obtain a Minghetti model.

43. Details of the progress of selection work will be found in Appendix E.

44. **HYBRIDIZATION.**—Progeny from the seven series of crosses made in 1951 are now in the F 2 generation. Single seedlings were planted out and close observation kept on them throughout growth. At harvest plants showing unwanted characters were discarded and the remainder of each cross bulked for sowing in the F 3 generation.

45. Four new crosses were made. No major change was made in the technique, saturated air at 43°C in a vacuum flask being used to force opening of the flowers. Small cages were made to protect crossed plants from bird damage.

46. In 1952 an experiment was started to try and find out what natural cross pollination occurred. There has been considerable genetic variation arising in pure lines in the past, and it was suspected that this might be due to some measure to natural cross pollination. Small bees have also been noticed collecting pollen from rice flowers and this also indicated that there was a possibility of cross pollination occurring. Eight concentric squares of single plants of a pure line non-pigmented rice were therefore planted and in the centre was placed a single plant of a pure line flowering on the same date and having anthocyanin pigmentation. Each square was harvested separately. This year the seed from each square was sown and the seedlings examined on the 5th to 7th day after germination. At this stage the presence of anthocyanin pigment can be seen in the first leaf sheath and it was thought that hybrids would be easily distinguishable, presence of pigment being taken to be dominant over absence. In the first square no pigmented seedlings were found out of 543. In the next square two pigmented out of 1,676. It was apparent that some crossing had occurred though it was not much, and that little satisfactory information would be obtained, so in view of the work involved and the shortage of staff it was decided to abandon the rest of the experiment.

47. **Local rices.**—One hundred and twenty-three local swamp rices and selections from them were grown in the maintenance collection. Several new ones were received from different parts of the country and were grown in plots for comparison with the types they resemble.

48. The collection of twenty-three local upland rices was maintained. No further work has been carried out on these since the original mass selection.

49. *Diseases*.—*Piricularia oryzae* caused severe scorch in the nurseries this year. The severity of the attack was partly due to infertility of the nurseries and partly due to a dry sunny spell during the nursery period. Both of these factors have been noted previously as having a great influence on the severity of *Piricularia* attack. This severe attack provided opportunity for detailed observations to be made on the maintenance collection. One or two varieties were so severely attacked that all seedlings died.

50. *Ephelis pallida* appeared on four varieties of rice this year, on two of which it had not been recorded previously. The attack was slight throughout; on only one variety, (D. 99) were more than half a dozen infected panicles found.

51. *Collections*.—Over 100 collections of phanerogams and ferns were made during the year for the station herbarium. Duplicates were sent to the herbarium of the Department of Agriculture and to Kew.

52. Monthly collections of algae were made from eleven sites on the tidal rice lands and sent to Bangor, where work is being carried out on them. Preliminary information shows a high proportion of diatoms and a surprisingly low proportion of cyanophyceae.

CHEMISTRY SECTION

53. With the delay in completion and fitting of the laboratories it was not possible for the newly appointed Chemist to start on any but preliminary work, and in fact a large part of his time was occupied in organising and checking equipment as it arrived.

54. As the first problem to be investigated will probably be associated with the empoldering of estuarine and riveraine soils, the present knowledge about such soils in Sierra Leone was reviewed and the available literature relating to apparently analogous soils in other countries was surveyed.

55. The water control observation which has been running at Rokupr for the past eight years was placed under the Chemist's control, but as the bunds required making up and this was likely to upset the yield figures it was decided to omit this year's yields from the records.

56. All empoldering schemes were visited by the Chemist and the conditions studied and soil samples taken. Particular attention was paid to the species of mangrove forming the natural vegetation and rough tests for chlorides and sulphide compounds were made as well as for pH. It is not proposed to discuss these preliminary tests in detail at this stage.

57. Visits were also made to rice areas near the coast where saline conditions are likely to cause trouble and the conditions were observed and soil samples taken for preliminary testing.

H. D. JORDAN,
for Principal Agricultural Officer.

WEST AFRICAN RICE RESEARCH STATION.

APPENDIX A METEOROLOGICAL RECORDS—ROKUPR, 1953

Bracketed figures—Rainfall 15 year average (1936–1950). Sunshine 10 year average (1941–1950). Temperature—10 year average and records (1941–1950). Humidity—11 year average and records (1939–1949).

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Rainfall	0.23 (0.02)	0.02 (0.05)	0.40 (0.37)	2.11 (1.79)	4.82 (6.66)	19.55 (14.00)	26.36 (23.39)	20.95 (29.34)	11.56 (18.22)	18.99 (14.47)	2.99 (5.57)	0.63 (0.76)	108.61 (114.64)
Sunshine	262.0 (252.1)	195.8 (229.6)	250.1 (238.7)	232.9 (201.0)	187.9 (198.4)	127.8 (165.0)	98.4 (102.3)	55.5 (62.0)	120.8 (132.0)	195.7 (198.4)	218.0 (201.0)	204.9 (226.3)	2,149.8 (2,205.8)
Mean Maximum Temperature	91.2 (91.1)	91.0 (93.1)	92.8 (93.3)	93.7 (92.6)	91.4 (90.9)	86.5 (87.9)	84.0 (84.0)	82.4 (81.7)	85.9 (85.5)	86.6 (88.6)	88.8 (88.9)	x (89.8)	x (88.9)
Absolute Maximum Temperature	96 (96)	95 (101)	100 (102)	98 (101)	96 (96)	91 (93)	88 (91)	88 (91)	89 (94)	90 (93)	91 (95)	x (95)	x (100)
Mean Minimum Temperature	70.4 (67.9)	69.9 (69.4)	71.8 (72.0)	72.7 (73.3)	73.5 (73.6)	73.2 (72.1)	74.7 (71.8)	72.2 (71.8)	71.9 (72.1)	71.8 (71.2)	71.9 (71.7)	71.0 (69.2)	72.1 (71.3)
Absolute Minimum Temperature	65 (55)	64 (61)	67 (66)	67 (69)	70 (69)	70 (67)	69 (67)	68 (68)	68 (68)	69 (68)	68 (68)	64 (13)	64 (53)
Mean Humidity A.M.	90.4 (87)	87.8 (87)	82.1 (82)	79.0 (79)	82.6 (83)	89.2 (89)	90.8 (93)	93.1 (95)	90.7 (93)	87.6 (91)	86.5 (91)	89.1 (88)	88.1 (88)
Maximum Humidity A.M.	100 (100)	100 (100)	100 (100)	91 (100)	95 (100)	98 (100)	95 (100)	100 (100)	95 (100)	95 (100)	95 (100)	100 (100)	100 (100)
Mean Humidity P.M.	54.5 (48)	50.9 (49)	52.0 (51)	52.4 (55)	59.6 (62)	75.0 (73)	79.1 (80)	85.7 (85)	78.8 (78)	69.2 (75)	67.7 (68)	61.2 (58)	65.5 (65)
Minimum Humidity P.M.	32 (12)	19 (15)	32 (19)	32 (28)	46 (34)	59 (44)	65 (56)	63 (54)	65 (51)	58 (57)	57 (37)	35 (23)	19 (12)

Rainfall in inches, Sunshine in hours. Temperature in degrees Fahrenheit. Relative humidity as percentages. Morning readings taken at 0900 hours. Afternoon readings taken at 1500 hours. x Maximum temperature readings are not available.

APPENDIX B **RICE SENT OVERSEAS, 1953**

Gambia:

Peru 22	..	..	..	ex Peru
Pokkali	..	..	..	ex Ceylon
Anak Ikan Gresing	..	..	..	ex Malaya
Kow Pa	..	..	..	ex Thailand
Gocong	..	..	..	ex Ceylon
Leung Ta	..	..	..	ex Thailand
Indo China 70	..	..	..	Selected Rokupr

C.D.C. Gambia:

P.T.B. 15	..	..	..	ex Madras
Kurulutuduwi b 13	..	..	..	ex Ceylon
Co 7/75	..	..	..	ex Madras
Batu ..	..	..	..	ex N. Borneo
Serendah Menangkabau	..	..	..	ex Malaya
Co 25	..	..	..	ex Madras
HM C 16	..	..	..	ex Burma
Mayang sa gumpal	..	..	..	ex Malaya
Ebandiaul	..	..	..	ex French Sudan
Kav. 12..	..	..	..	Selected Rokupr
India pa lil 46	..	..	..	" "
Toma, 112	..	..	..	" "

Hyderabad:

Toma 112	..	..	..	" "
Bolo 108	..	..	..	" "
India pa lil 46	..	..	..	" "
Yenti 38	..	..	..	" "
Kalimodu 50	..	..	..	" "
Ngasein 57	..	..	..	" "

Liberia:

D 99 ..	..	..	..	ex British Guiana
Lead ..	..	..	..	" "
B.G. 79	..	..	..	" "
D 52/37	..	..	..	" "
Toma 112	..	..	..	Selected Rokupr
Bolo 108	..	..	..	" "
Kav. 12..	..	..	..	" "
India pa lil 46	..	..	..	" "
Ngasein 57	..	..	..	" "

Nigeria:

Kurulutuduwi b 13	..	..	..	ex Ceylon
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British Guiana:

Afaa Mwanza	..	..	..	ex Tanganyika
2/16 ..	..	..	..	" "

Tanganyika:

Indo China 22	..	..	..	Selected Rokupr
" " 24	..	..	..	" "
" " 53	..	..	..	" "

APPENDIX C
FARM YIELDS, 1953

Block	1935-43	1944	1948	1949	1950	1951	1952	1953
2 ..	1,070	570	2,160	510	2,270	1,730	1,840	870
4 ..	1,250	1,110	530	580	1,370	1,420	1,630	190
5 ..	1,570	830	930	720	1,260	1,320	1,660	720
7 ..	1,280	1,710	1,710	2,220	480	2,200	2,370	1,580
10 ..	1,550	3,190	540	2,030	1,740	970	2,650	1,170
11 ..	1,330	2,280	290	1,440	1,220	580	2,370	1,420
13 ..	1,810	2,740	1,290	2,630	2,680	960	2,540	460
14 ..	1,570	2,170	10	1,649	2,670	1,000	2,480	1,760
16 ..	1,910	—	3,300	2,490	2,030	440	2,360	—
17 ..	1,650	3,020	2,940	2,870	3,520	580	1,760	—
19 ..	1,990	2,530	2,970	2,460	1,800	3,080	2,430	—
20 ..	—	—	2,430	2,700	1,900	340	2,840	910
22 ..	1,650	770	720	1,760	1,560	2,310	2,940	—
23 ..	2,080	1,050	1,130	2,400	2,190	2,310	2,660	—
25 ..	1,710	1,560	1,780	2,950	2,460	2,620	3,170	270
26 ..	2,300	680	860	1,860	2,840	1,720	3,480	280
27 ..	2,840	1,020	840	2,050	2,360	2,280	3,080	480
28 ..	2,040	2,640	2,100	1,940	1,710	1,660	1,520	860
29 ..	—	—	1,840	930	1,640	1,650	1,840	—
30 ..	—	—	—	—	—	610	1,600	840
31 ..	—	—	2,710	810	1,680	1,830	1,170	—
32 ..	—	—	600	160	930	600	500	1,930
33 ..	—	—	1,740	900	840	1,540	1,210	—
34 ..	—	—	1,320	1,290	800	780	1,970	1,170
35 ..	—	—	1,210	1,040	1,070	1,360	1,320	—
36 ..	—	—	1,500	1,590	790	910	1,460	440
37 ..	—	—	1,840	960	1,440	1,100	1,150	1,150
38 ..	—	—	—	—	—	780	1,190	470
39 ..	—	—	680	530	1,260	660	1,010	860
40 ..	—	—	—	—	—	130	660	310
41 ..	—	—	1,450	1,320	1,750	1,350	1,720	1,210
42 ..	—	—	—	—	—	980	1,370	810
43 ..	—	—	1,310	1,500	2,580	2,210	2,440	1,090
44 ..	—	—	1,870	950	1,170	1,430	1,420	950
45 ..	—	—	1,310	750	1,530	1,140	1,670	1,000
46 ..	—	—	—	—	—	610	1,380	800
47 ..	—	—	—	—	—	1,100	910	360
48 ..	—	—	—	—	—	1,130	1,270	380
49 ..	—	—	—	—	—	880	910	370
50 ..	—	—	2,750	2,200	2,970	2,530	520	1,370
51 ..	—	—	1,810	1,280	1,980	1,360	1,280	1,860
52 ..	—	—	1,380	990	870	1,160	2,430	1,160
53 ..	—	—	1,680	950	1,320	1,190	1,590	1,550
54 ..	—	—	1,440	740	1,210	1,130	1,820	650
55 ..	—	—	—	—	—	1,080	1,650	590
56 ..	—	—	—	—	—	880	690	670

1944—First year of empoldering Blocks 1-27

1948—First year of regained tidal conditions except Blocks 10, 11, 13 and 14.

Block 2 had heavy fertiliser application in 1950. Blocks 10, 11, 13 and 14 were made tidal in 1949, water controlled again in 1950 and made tidal in 1952. Block 50 was only partly planted in 1953 on an old drainage channel and did badly.

APPENDIX D RICE INTRODUCED, 1953

From Gambia:

Kalagale (C48-2)

From Swaziland:

U.V.S.

From Cameroons:

Bafia
Baale Ede
Bixa
Yangambi
Bandakai
Fam 77
Razza 71
Balila
Cam. 135
Cam. 142
Cam. 152
Cam. 153

From the Hague:

Brondal Pulit 277 (ex Indonesia ?)
Benony
Baak
T'jima
Gendjah Ratje
Gendjah Beton

From Viet Nam:

Nang Rung
Nang Tay Nho C
Tau Binh C

APPENDIX E SELECTIONS

The following table shows the number of strains retained since selection work was reinstituted in 1945:—

				1945	1946	1947	1948	1949	1950	1951	1952	1953
Toma	..	..	..	163	40	18	4	4	4	3	3	3
India pa lil	..	..	..	320	44	25	5	5	5	5	5	5
Kavunginpoothala	..	..	..	155	46	27	5	5	5	5	5	5
Indo China	..	..	..	269	49	30	10	9	7	6	6	4
Ngasein	..	..	..	134	43	25	3	3	3	3	3	3
Pokkali	..	..	..	—	10	10	8	6	6	6	5	5
Toma	..	..	..	—	—	76	27	26	11	11	10	10
India pa lil	..	..	..	—	—	56	11	8	8	8	8	8
Yenti	..	..	..	—	—	85	33	25	6	1	1	1
Kalimodu	..	..	..	—	—	131	51	45	11	10	10	10
Lead	..	..	..	—	—	—	—	341	33	24	8	8
Sughandi	..	..	..	—	—	—	—	143	37	37	14	8
B.G. 79	..	..	..	—	—	—	—	33	30	20	7	7
Kurulutuduwi b. 13	..	..	..	—	—	—	—	35	32	22	10	6
G.E.B. 24	..	..	..	—	—	—	—	—	113	31	22	6

APPENDIX F EPHELIS PALLIDA ATTACK

The following table shows the progress of attack by this fungus since it was first noted in 1946-
A cross indicates that the variety was not grown on the farm in a particular year.

Variety	1945	1946	1947	1948	1949	1950	1951	1952	1953
Fortuno	no	yes	no	no	x	x	x	x	x
Sagbala	no	yes	yes	no	x	x	no	no	yes
Konko	no	yes	yes	no	x	x	x	yes	x
Atebubu	no	yes	yes	no	x	x	x	x	x
P.T.B. 15	x	no	no	yes	no	no	no	no	no
Kav.	no	no	no	yes	no	no	yes	yes	no
D. 99	no	no	no	no	no	no	yes	yes	yes
Ngasein 57	no	no	no	no	no	no	yes	no	no
Toma 112	no	no	no	no	no	no	yes	no	no
Indo China 70	x	no	no	no	no	no	yes	yes	no
Sidiankay	x	x	x	x	x	x	no	yes	x
B.G. 79	no	no	no	no	no	no	no	yes	no
B.G. 79/22	x	x	x	x	x	no	no	yes	no
Toma 280	x	x	x	no	no	no	no	yes	no
Reru 22	no	no	no	no	no	no	no	yes	no
D. 52/37	x	x	x	x	no	no	no	yes	no
Haji Harun	x	x	x	x	no	no	no	yes	no
HBJ 1	x	x	x	x	x	x	no	yes	no
DC 39/15	x	x	no	no	no	no	no	yes	no
G.E.B. 24/9	x	x	x	x	x	no	no	no	yes
1/18	x	x	x	x	x	no	no	no	yes

G.P. 1175/55/400/7.55.

